1895MNRAS..55..325C

Circumstances prevented me from carrying these trials forward on a more extensive scale at that time, although I always hoped to resume them. I wish here to express my gratification that one so able, in every sense of the word, as our esteemed President, has undertaken to elaborate this very promising form of telescope. From my own experience I venture to predict that such work will be crowned with perfect success.

*Smith Observatory, Geneva, N.Y., U.S.A.:*
1895 *March* 6.

## *The Brachy Telescope of Messrs. Fritsch and Forster, of Vienna.*

By A. A. Common, LL.D., F.R.S.

At the last meeting of this Society I mentioned that I had received a courteous letter from Mr. Fritsch, of Vienna, stating that he and Mr. Forster had invented the form of telescope I described in my note of January 8, and asking that their claim to priority in the invention should be acknowledged by the Royal Astronomical Society. I then stated that I could not allow this claim, as I had that morning read a letter (in the *English Mechanic*) from a Mr. Coates, of Manchester, in which he stated that a similar telescope was described in a book he possessed, published in 1825. Mr. Fritsch expresses surprise that I had not seen any description of the telescope, which ran through nearly all the periodicals of science. I expressly state in my paper that the only information I had was derived from Dr. Schroeder, who stated that this form of telescope had been made in Germany many years ago. From what he said I understood nothing had been published about this telescope, as he spoke of writing a paper on the theory of the form of this telescope. He gave me some data when I was thinking of making my 5-foot telescope, and I went so far as to make a 6-inch telescope on those data, which, however, did not succeed so well as I expected, nor so well as the combination I give in my note.

Mr. Coates's letter was written in answer to a letter in a previous number of the *English Mechanic*, written by Mr. W. R. Brooks, describing some experiments made in 1884, asking if he should prove to be the prior inventor (although he does not appear to have published any account before this) that the telescope should be called the "Brooksian Reflector," and so far as I can see neither Mr. Fritsch nor myself could object to this name for that form where the distortion of the image produced by oblique reflection from the concave is corrected by proper tilting of the plane mirror.

Since the last meeting Mr. Coates has kindly sent me the book he refers to in his letter. It is called *The Panorama of Art*, published in London by Fisher in 1825. I have made the

1895MNRAS..55..325C

abstract which I give below, from which it will be seen that the particular form of telescope in question was undoubtedly made in England before 1825.

"Of reflecting telescopes the Gregorian is almost the only one made for common use. This preference seems to be owing to the neatness of its appearance, and to its being pointed towards objects in the same manner as refracting telescopes, rather than to any really intrinsic advantages which it has over the Newtonian construction. In all the reflecting telescopes we have noticed the diameter of the large mirror, on account of the interposition of the small one at the aperture, must be greater than would otherwise be required in order to enlighten the field of view sufficiently; and it may also be observed that, as specula have probably never been ground to a truly parabolic figure, the central part, the benefit of which is lost, is the most valuable portion of the whole because it would reflect the light with the greatest regularity. To this it may be added that the difficulty of grinding a speculum increases perhaps in so great a proportion as the square of the diameter, and it is therefore of some importance to those who may undertake the construction of these instruments for themselves to make the large speculum as small as possible consistently with a given power and quantity of light. We shall therefore mention the form of a reflecting telescope which we recollect to have been shown many years ago by a self-taught optician, who, so far as we can recollect, on the question being put to him, declared himself to be the first who had adopted it. It is represented by fig. 5, pl. vii., where the great mirror is, as usual, at the bottom of the principal tube; but instead of having its axis coincident with that of the tube, it is inclined so as to throw the image upwards through an aperture for that purpose to *n o*, whence the rays diverge, and falling upon the small speculum are reflected by it to the eye, as in the Gregorian telescope. Here we have supposed the small mirror to be concave, but we are not certain whether it was so or not. It is clear the principle of it is pre-

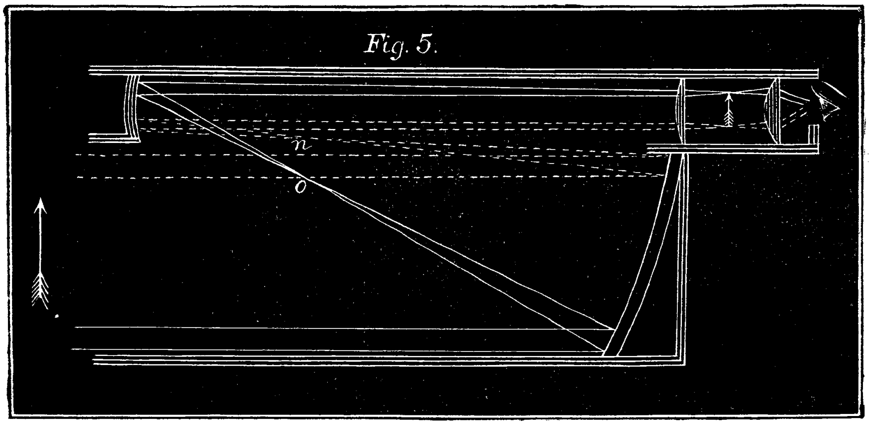

*Fig. 5.*

1895MNRAS..55..325C

served if the whole diameter of the mirror is employed to reflect light; and therefore it may have the small mirror convex like Cassegrain's reflector, or plane like Newton's. We can speak with confidence of the excellence of the instrument we allude to, and we gladly bear this testimony to the merit of an obscure individual who, we have reason to believe, is now deceased. He was tenacious of his optical knowledge, and reserved in speaking of it; yet he was far from an illiberal character. His mirrors were cast by himself in his own house, and every other part of the workmanship of his instruments, and the tools with which they were made, were constructed by himself. In solitude and silence, by day and by night, though surrounded by the chilling difficulties of poverty, he seems to have pursued his studies with an assiduity seldom paralleled; and the knowledge which it cost him so much to acquire he might feel it difficult to part with to a casual acquaintance. Perhaps the notice we have taken of him in this place may be more than is called for by any proof we have given of his abilities in the new arrangement of a telescope, but the example may be an encouragement to others, and ought not to be lost."

1895 *April* 2.

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## *Note on the Observations for Coincidence of the Collimators in Flexure Determinations with the Transit Circle of the Royal Observatory, Greenwich.*

(*Communicated by the Astronomer Royal.*)

In the Introduction to the *Cape Catalogue* for 1885 Dr. Gill (p. 35) repeats the suggestion made by Professor Newcomb ("North Polar Distances of the Greenwich Transit Circle," p. 416) that a possible cause for the apparent change of flexure of the transit circle since the piercing of the cube in 1864 September may be found in the systematic error introduced in viewing the wires of the collimator through the cube. Some observations for coincidence of the wires of the N. and S. collimators, viewed respectively through the cube and with the transit circle raised, were made in 1884 and 1885 to test this point, but by inadvertence this was not mentioned in publishing the resulting flexure determinations, and the readings for coincidence of the collimator-wires by the two methods were not given. This seems a favourable opportunity for placing them on record.

Determinations of flexure were made according to the following scheme:—

(1) Ten readings of S. collimator on N. collimator through the cube.

(2) Ten circle readings on each of the collimators.

(3) Ten readings of S. collimator on N. collimator through the cube.